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ABSTRACT

Trained and untrained teachers (N=37) of gifted students (grades 2 through 6) were observed and compared in the areas of individualization, cognitive quality of interaction, response patterns, and overall differentiation. Teachers were trained in applying B. Bloom's taxonomy to questioning techniques and in using management strategies for individualized instruction. As hypothesized, trained teachers used a greater variety of instructional patterns, asked more higher cognitive level questions and responded more facilitatively. Students in these classes gave more higher level responses and initiated interaction more often. Unexpected results included an indication that the most higher cognitive level activity occurs in small group settings. Results indicated that a teacher's qualifications for facilitative classroom interaction lie in use of a variety of grouping patterns, spontaneous use of higher level questions, and facilitative responding rather than correcting or praising comments. (Author/CL)

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Verbal Interaction Behaviors of Teachers of the Gifted

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Abstract

Trained and untrained teachers of the gifted were observed and compared in the areas of Individualization, Cognitive Quality of Interaction, Response Patterns, and Overall Differentiation. A systematic classroom observation instrument developed for the study was effective in differentiating between the two groups. As expected, trained teachers used a greater variety of instructional patterns, asked more higher cognitive level questions and responded more facilitatively. Students in these classes gave more higher level responses and initiated interaction more often. Unexpected results included an indication that the most higher cognitive level activity occurs in small group settings. Results are discussed in terms of implications for evaluation of differentiated instruction.

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Do teachers of the gifted actually employ behaviors that are different from those used by teachers in regular classrooms?

Although recommendations for training teachers of the gifted include a variety of unique teaching-learning strategies, specific teacher behaviors have not been operationally defined. Two problems are created by this condition. First, criteria for determining when a teacher is prepared to teach the gifted are unavailable and second, criteria for identifying the occurrence of differentiated instruction can at best, be only partially defined.

A search for operationally defined behaviors for teachers of the gifted begins with the basic assumptions underlying the need for differentiated instruction. Originally, this need was defined simply as, "differentiated instruction that is not now offered in existing classrooms", (Marland, 1972; Gallagher, 1975; Maker, 1975). Cohn (1977) and Daurio (1977) clarified a distinction between two major approaches to differentiated instruction. Acceleration required only that students be placed in already existing environments ahead of their chronological peers. This form of differentiation holds no implications for teaching acts. It is not the teaching that is differentiated, merely the setting.

Enrichment, on the other hand, prescribes that gifted students will receive instruction that is differentiated in both content and methodology. Enrichment differentiation implies an instructional setting that was previously non-existent. New and different teaching behaviors are presumably required in the enrichment form of differentiated instruction.

The precise nature of these behaviors begins to emerge in the recommendations for characteristics of teachers of the gifted. Early lists however,

tended to be overly general and more often than not, listed most of the virtues of mankind. A list prepared by Maker in 1975 summarized these early traits:

- Highly intelligent.
- Flexible and creative.
- Self-confident.
- Wide variety of interests.
- A sense of humor.
- Fairness, firmness, patience.
- Sympathy with the problems of the gifted and talented children.
- Clear self-understanding and understanding of the teacher's role.
- Willingness to devote extra time and effort to teaching.
- Enthusiasm about teaching and the subject matter.
- Willingness to be a facilitator rather than a "director of learning."
- Love of learning and desire to continue learning.
- Enjoyment in working with gifted and talented children.

A survey of characteristics recommended for teachers of gifted/talented children completed by The Instructor, in 1977 produced a ranking of 22 characteristics. The top five characteristics were:

1. Flexibility and acceptance of differences.
2. Skill in developing independent activities.
3. Originality, imagination, curiosity.
4. Desire to teach G/T children.
5. Honesty.

Some refinement in teaching behaviors is available in specific prescriptions for teacher training.

> "It is recommended that in addition to the general characteristics listed, the following must be among the "existing" criteria for teachers of students gifted in general intellectual abilities and specific academic aptitude: skill in and willingness to utilize questioning techniques and teaching methods that develop higher thought processes in gifted students; extensive knowledge of basic concepts in the subject being taught as well as related fields; and knowledge of media and materials particularly useful in his area of teaching." (emphasis added) (Maker, 1975, p. 18)

Coletta (1975) presented an argument, based on extensive reviews of the literature, that a reflective style of teaching was more desirable than a didactic approach. He recommended use of a modified Flanders model that in-

corporated Blooms Taxonomy as a basis for assessing which reflective traits could actually be taught to prospective teachers. His reflective strategies emphasized questioning behavior and, "active listening".

Martinson and Wiener (1976) stressed teacher flexibility, use of higher cognitive level questioning, and teacher encouragement in a 19-item rating scale of significant behaviors in teachers of the gifted. Although no data were offered on the distribution of behaviors in either gifted or regular classrooms, the scale, like Coletta's, was based on an extensive review of the literature.

McCarthy (1979) reviewed several sources of teaching behaviors and essentially found that differentiated instruction required the teacher competencies of:

> ability to develop lesson plans to stimulate higher order thinking.
>
> ability to utilize strategies to develop divergent thinking, problem finding, problem solving, and/or higher order questioning.
>
> ability to group students according to interests or other assessment indices.

Although even the refined prescriptions fail to operationalize teaching behaviors when taken in conjunction with anticipated student outcomes there are clear implications for teachers of the gifted. Teachers are to engage in behaviors that increase the frequency of higher cognitive level thinking and will address the unique needs of gifted individuals. Individualization and higher cognitive level thinking are therefore viewed as the major attributes of an enrichment-oriented form of differentiated instruction for intellectually/academically gifted students.

Procedures

Teaching behaviors designed to fulfill these program requirements were culled from the work of Amidon and Giammatteo (1965), Gallagher (1975) and Taylor and Ellison (1975). A list of teaching behaviors initially derived from these sources included a variety of personality traits and non-performance characteristics. This list was reduced to four operationally defined behaviors in cooperation with a group of 54 teachers participating in a Title IV-C Training Project for Teachers of the Gifted.

The Teachers of the intellectually/academically gifted will:

1. meet the needs of individual students as manifested in a variety of grouping patterns throughout an instructional period.
2. present questions and activities requiring higher cognitive level (analysis, synthesis, and evaluation) responses from gifted students.
3. respond to student answers and products with acknowledgements and questions for clarification rather than judgemental responses.

The Training Program

Fifty-four teachers from seven school districts (a Title IV-C sponsored project) participated in two, three-week training programs for teachers of the intellectually/academically gifted student. Teachers were trained in applying Blooms Taxonomy to questionning and activities for inclusion in normally taught units of study. Teachers were also introduced to a variety of management strategies designed to differentiate and individualize instruction for gifted students.

Teachers were pre- and post-tested with a test, "Knowledge of Teaching the Gifted" prepared specifically for the project. Units of study prepared by teachers were evaluated by applying Bloom's Taxonomy to all activities written by the teachers. All teachers trained demonstrated statistically significant growth on the "Knowledge" test. A mean gain of 16.7 on the 38 item test was significant at the .001 level (correlated t-ratio with 52 df.) Units of Study prepared by teachers had a mean of 63% higher level activities. This compares with the 8% frequency of higher cognitive level activities reported by Marland (1972).

The Schools

Seven districts participating in the project had made commitments to developing programs for the gifted. Districts ranged in size from one with 500 elementary level students to one with 10,000 students. Districts were located in rural and suburban communities in Central Western New York State with per student expenditures ranging from $2,000 to $3,100.

Four types of delivery systems for the enrichment form of differentiation emerged in the seven schools. These included:

Resource Room (2 districts) - Gifted students spent part of their school week in a resource room located in the building. Time in the resource room by any one student ranged from one to seven and one/half hours per week.

Self Contained (2 districts) - Gifted students spent the majority of their day in a classroom comprised entirely of gifted students. Special classes (e.g. music, art) were in heterogeneous groups.

Departmentalized (2 districts) - Gifted student schedules were arranged so that all gifted students could be taught at least one subject by a teacher trained to work with the gifted. The subject was generally language arts and the period was either a standard 45 minute and/or occasionally a double (90 minute) period.

Heterogeneous (1 district) - Gifted students were distributed throughout regular classrooms in a mainstreamed setting with no special time or space differentiation provided. Students with gifted characteristics were identified and singled out for differentiated instruction on a variable schedule.

The Study

Although research was not included in the original teacher training project proposal, the lack of empirical evidence focusing on teacher behaviors in differentiated instructional programs prompted this ad hoc investigation. The study focused on teacher behaviors in the four different management systems adopted by the participating districts. Although student products, teacher competencies as measured by micro-teaching and paper and pencil tests, and teacher interaction with students were explored as potential sources of evidence for clarifying differentiated instruction, it was concluded that classroom interaction analysis would serve as the most reliable source of data. The arguments for this approach appear in Rosenshine (1970); Simon and Boyer (1974), and McCarthy (1979).

The three teacher behaviors developed as the primary focus of the training program were translated into a systematic classroom observation instrument of sixteen teacher-student interaction behaviors. Sixteen mutually exclusive

categories (see appendix) were derived initially to account for both teacher and student type of question, teacher reinforcement strategies and grouping patterns. A trained observer using the instrument, recorded each independent and discrete unit of verbal behavior emitted by the teacher. Student responses to teacher directions/questions were also recorded. Verbal behavior of students who were not interacting with the teacher were ignored.

Development of the observation instrument proceeded through the following steps:

1. Identification of observable behaviors in cooperation with trained teachers of the gifted.
2. Face validity of characteristics and definitions established by a panel of three experts.
3. Field-testing by the two authors of the instrument.
4. Revisions based on problems encountered in the classroom. (Note - it was necessary to drop specific question category and simply record lower or higher cognitive question)
5. Establishing an interrater reliability index. (r = .85 to .95 in five independent and simultaneous observations of teachers by the two authors)

Sample

The study was carried out in the seven school districts participating in the Title IV-C training project. A total of 37 teachers in grades two through six were observed; twenty-six trained and 11 untrained (control) teachers. All trained teachers were working with gifted students who were, for the most part, identified based on academic criteria. In some cases, creativity, leadership, and motivation had been included in the identification process. All control

teachers managed heterogeneous classrooms with a normal frequency of gifted students. Control teachers were selected from neighboring districts not participating in the Title IV-C Training Program.

No attempt was made to schedule a pre-determined block of observation time with teachers. The very flexible nature of gifted programs would have been modified in trying to regulate the observation period. As it turned out, the observer often followed a teacher to a library for work with a small group while a majority of the class remained in the classroom. At other times, groups of students would disperse to a variety of locations for independent or small group work leaving the teacher alone with one or two students or a non-gifted population.

Hypotheses

Ten hypotheses related to the operationally defined behaviors considered desirable for gifted teachers were investigated. The hypotheses focus on the differences between teachers trained in the implementation of differentiated instruction and untrained teachers in the areas of individualization, cognitive quality on interaction response patterns and overall differentiation. Comparisons across type of program and group size were also made.

Individualization

Hypothesis 1: Trained teachers will use small groups and one-to-one instructional patterns more often than control teachers, regardless of program type.

Hypothesis 2: Trained teachers will lecture less (use large group instruction) than control teachers.

In order to meet the needs of individual students within instructional goals, it was hypothesized that teachers would need to use a variety of grouping patterns. Large group instruction would be used infrequently and reserved

primarily for presenting information. Since one of the characteristics of intellectually gifted students is their ability to master information quickly and easily, it was expected that large group instruction would be used less frequently with gifted students than small group or one-to-one grouping patterns.

Hypothesis 3: Self-contained programs will have the most small group and one-to-one instruction followed by Heterogeneous, Resource Room and Departmentalized programs.

Higher level thinking questions and activities tend to generate multiple responses. Since most of the students in a Self-contained class would be working on these activities, more small group and one-to-one instruction would be required. Differentiation in a heterogeneous classroom would also require more of these instructional patterns because of the diverse population, but fewer higher cognitive level responses would be possible because of the basic need of most of the students for direct instruction. Resource Room programs generally serve small groups or individuals because of their focus on individual needs and interests. Departmentalized programs have a limited amount of time in which to present and differentiate instruction. They would be less likely than Resource Room programs to have the desired instructional patterns.

Cognitive Quality of Interaction

Hypothesis 4: Interaction of trained teachers and their students will be characterized by more higher level thinking questions and responses than interactions of control teachers and their students.

Hypothesis 5: The frequency of higher level thinking questions and responses will increase as the size of the group decreases.

Since the basic premise of differentiated instruction is that gifted students are capable of higher level thinking and require questions and activities which provoke it in order to realize their potential, the quality of both

teacher's questions and student's responses were examined. It was anticipated that there would be more high cognitive level interaction in the trained teacher's questions. The cognitive quality of teacher prepared activities and student response was not examined. The percentage of higher cognitive level questions was also expected to increase as the size of the group decreased.

It was expected that the highest percentage of higher level thinking questions would occur in one-to-one settings, followed by small groups. It would seem that the one-to-one relationship would facilitate the use of higher cognitive level questions specifically related to the student's work.

Teacher Response Patterns

Hypothesis 6: Trained teachers will more often acknowledge or offer suggestions in response to students and less often confirm, correct or praise than control teachers.

Hypothesis 7: Students of trained teachers will initiate interaction more often than students of control teachers as indicated by a greater percentage of student information-giving and fewer teacher command/requests.

It was hypothesized that trained teachers of the gifted would be less judgmental than untrained teachers. This kind of teacher response was expected to be accompanied by an increase in student-initiated responses. The atmosphere which these categories (in the expected direction) is meant to capture is one of "shared inquiry."

Overall Differentiation

Hypothesis 8: Trained and control teachers will be similar in the areas of Student Questions, Small Talk, Observing by Teacher, and General Categories.

Hypothesis 9: A differentiated program is characterized by an increased frequency of Higher Level Questions (6), Category and Responses (2), Student Offered Information (4), Teacher Acknowledgement and Suggestion Responses (5), Teacher Commands/Requests (8), Lecture (9), Teacher Response of Confirming (13), Correcting (14), and Praising (15).

Given the hypothesized characteristics of teachers of the gifted, there did not appear to be any theoretical reason why trained and untrained teachers of the gifted should differ on the dimensions identified by Hypothesis 8.

A later study (Nasca, in press), however, has suggested that student questions may be influenced by the cognitive quality of questions in the instructional setting. Given Hypothesis 1-6, Hypothesis 9 is a composite of characteristics of the differentiated program.

Hypothesis 10: Resource Room programs will have the greatest differentiation as defined by higher percentages in categories 2, 4, 6, 10, 12, and lower percentage in categories 1, 5, 8, 13, 14, 15 followed by Departmentalized, Self-contained, and Heterogeneous Organizations.

Results

The data recovered from observations was converted into proportions of verbal interactions in each of the 16 categories for each teacher by type of program and by size of group that the teacher was interacting with. The data was analyzed in observation units by group size. That is, for each teacher observed, as many as three observation units; one large group, one small group, and one individual interaction unit might emerge for analysis. This method of collating data resulted in 100 observation units derived from 48 discrete 30-60 minute observations of 37 different teachers.

It can be seen from Table 1a that statistically significant differences in grouping patterns exist between classrooms of trained teachers and classrooms of control teachers. Although some of this difference is due to program size, it is apparent that trained teachers operating in gifted programs have maintained a more evenly balanced distribution of grouping patterns than have untrained teachers working in regular classrooms.

(Insert Tables 1a & 1b about here.)

Part of the variation in departmentalized and resource room programs reported in Table 1b is due to the fact that total group size was occasionally

less than 12. Therefore, even though the teacher was working with the entire group, the recorded observation is included under small group. For this reason, the Chi-square statistic for Table 1b reflects both program size and program grouping differences.

Tables 2 through 4 present the percent of time teachers spent on each of the sixteen verbal behaviors included on the observation instrument for each of the three main comparisons in the study, experimental and control, group size, and program type.

Major differences are noted in the level of questioning category (5 and 6) and level of student response categories (1 and 2). Differences are also noted in the command/request and lecture category (8 and 9) and in the acknowledging (12) category. All differences are in the anticipated direction.

Although there is not a statistically significant difference across the four program types, it may be observed that the heterogeneous program looks more like the control group setting (Table 2) than it does any of the other delivery systems. Teachers working with heterogeneous populations that include only one to three gifted students tend to carry on verbal interactions resembling those of untrained teachers.

Although the group size by verbal interaction category analysis results in nonsignificant statistical difference, there is one substantive difference, i.e. the frequency of higher cognitive level responses (2). The surprisingly low frequency of higher cognitive responses in teacher interactions with individuals reflects a diagnostic pattern and/or management type questions. Teachers working with individuals more often focus attention on what the child has done, how he/she has done it, or what specific plans the student has for next steps. It is also worth noting the relatively high frequency

of higher cognitive level questions (6) in small group settings. This finding was unanticipated.

(Insert Tables 2-4 about here.)

Tables 5 through 9 compare experimental (trained teachers of the gifted) with control teachers on two subsets of verbal behavior. Statistically significant differences are seen only in the questioning behavior of teachers and responding patterns of students in Table 5 and in what have been classified as positive attributes of gifted classrooms and negative attributes of interactions with gifted students. Teacher responses to student answers and initiated statements (Table 6) show almost no differences. A set of neutral teacher behaviors that were not expected to show differences between groups (Table 7) confirm expectations.

(Insert Tables 5-7 about here.)

Table 8 presents a comparison of four particularly desirable behaviors in gifted classrooms. Teachers trained to work with gifted students carry on these behaviors more often than untrained teachers.

Table 9 presents a comparison of seven less desirable behaviors in interacting with the gifted. Although again lacking in statistical significance, there is a substantial difference in favor of the experimental group.

(Insert Tables 8 and 9 about here.)

Tables 10 and 11 present verbal behaviors that tend to be less desirable in gifted classrooms. There are no statistically significant differences across program type (Table 10) or size of group (Table 11) for

this subgroup of behaviors. The heterogeneous classroom (Table 10) does not have a substantially larger percentage of these behaviors (63.7%) than the other three program types. Small groups (Table 11) tend to have fewer of these behaviors (44.1%) than either interactions with large groups or individuals.

(Insert Tables 10 and 11 about here.)

Tables 12 and 13 present results of what may be classified as neutral interactions, i.e. interactions that are neither seen as particularly needed nor detrimental with gifted students. As expected, there are no significant differences and only minor trends that are not interpreted.

(Insert Tables 12 and 13 about here.)

Tables 14 and 15 compare type of group and group size on the subset of interaction behaviors considered desirable for use with gifted populations. Although statistical significance is not a characteristic of the findings, it may be observed that trends favor small groups and any program other than a heterogeneous grouping pattern.

(Insert Tables 14 and 15 about here.)

These relationships were hypothesized based on the content requirements of each management structure. The Resource Room program focuses heavily on differentiation with no academic content requirements. Each of the other programs has the basic curriculum to teach in addition to differentiated instruction. The Departmentalized program typically is responsible for mastery of only one content area and students are chosen based on proficiency in that area. Although the basic curriculum must be taught in the self-contained classroom, homogeneous grouping would seem to contribute

to substantial differentiation. Heterogeneous programs not only have the basic curriculum to teach, but must also deal with a wide range of abilities in students.

Discussion

Individualization

Hypothesis 1 and 2 were confirmed by the data. There was a significant difference in the grouping patterns used by trained and untrained teachers. As expected, the trained teachers used the three grouping patterns almost equally, whereas the untrained teachers used predominantly large group instruction. Of the three grouping patterns, trained teachers used slightly more one-to-one instruction than the other two. This is consonant with the emphasis on meeting individual needs through independently pursued projects in the differentiated curriculum.

Hypothesis 3 was not confirmed. It was expected that the frequency of a grouping pattern other than large group would increase across program types from Departmentalized, Resource Room, Heterogeneous, to Self-Contained. The results were an increase across program types from Self-contained, Departmentalized, Heterogeneous, to Resource Room. In conducting the observations, several reasons for this became apparent. The self-contained classrooms were frequently characterized by brief large group instruction by a guest speaker, one or more of the students, or the teacher. In addition, several large group activities such as simulation games could not be coded as small group or individual interaction because usually the teacher was an observer. On the other hand, trained teachers in Heterogeneous and Departmentalized programs were required to use small groups and individual instruction to accomplish differentiation. Likewise, the Resource Room programs observed seldom had enough students at one time to be classified as a large

group even though instruction might have been occurring to the total group. In order to distinguish between these conditions, a redefinition of large and small groups in terms of "total" and "subset of the total" instead of the number of students would be needed.

The expectations that trained teachers would use different grouping patterns than untrained teachers was fulfilled. Examined by program type, the self-contained experimental classroom most closely resembles the control group in the amount of large group instruction used, but that is the extent of the similarity. The differentiated program in the self-contained program uses far more individual instructional activities than the control group. Regardless of program type it would seem to be the case that teachers of the gifted need to be adept in using different grouping patterns to meet the needs of their particular instructional group whether they be homogeneously or heterogeneously grouped.

Cognitive Quality of Interaction

Hypothesis 4 was confirmed (Table 2). Categories 5 and 1 are lower level questions and responses, and Categories 6 and 2, higher level questions and responses. Although the method of analysis did not permit specific comparisons within those categories, visual inspection reveals marked differences. Trained teachers asked lower level questions 11.9% of the time and higher level qeustions 5.0% of the time whereas untrained teachers asked lower level questions 15.5% of the time and higher level questions only 0.4%. This difference in level of questions was reflected in the differences in cognitive quality of student responses. Students of trained teachers had an almost equal number of lower and higher level responses; 12.9% lower level, 12.1% higher level. Students of untrained teachers in whose classes very few

higher level questions were asked, responded very seldom at a higher cognitive level; 20.9% lower level, 0.9% higher level. It is interesting to note that even though lower level questions were asked a greater percent of time, the cognitive level of students responses was equal between lower and higher levels. This could indicate that when students are encouraged to think at higher cognitive levels with some questions, they do so in other situations as well. This is supported by the common notion that gifted students sometimes do poorly on standardized tests because they read too much into the questions.

The total difference between trained and untrained teachers on all categories was not significant. This was expected since the observation instrument was designed with positive, negative and neutral components of a differentiated program.

Hypothesis 5 was not confirmed by the data. It was expected that the largest percent of higher cognitive level questions and responses would occur in one-to-one interaction. Instead, the data indicate that the largest percent occurs in small groups. Observers report that individual interactions were often for the purpose of diagnosis, or management, i.e. checking on student's progress on a particular task, and planning for the next steps in a process. Small groups were characterized by groups of students who had mastered a set of common information, so the teacher's questions could more often require the processing of that information. Large group instruction was, as anticipated, primarily for relaying factual information. Teachers seemed to use higher cognitive level questions only to begin or end a large group session.

Response Patterns

Hypothesis 6 was confirmed by the data. Trained teachers responded more often to students by making suggestions or acknowledging than by confirming, correcting, or praising than untrained teachers did. The difference between

groups was most marked in Category 12; Acknowledging. The use of these valueless responses is particularly important in encouraging divergent thinking (Feldhusen and Treffinger, 1974).

Hypothesis 7 was also confirmed by the data. Two categories, student's volunteering information and teachers use of command/requests, were taken as an indication of the degree of students' initiation of interaction. In both categories (4 and 8), results were in the expected directions. Establishing an environment which encourages student initiated behavior is particularly important for individualization as well as the development of student independence.

Overall Differentiation

Hypothesis 8 was confirmed. There was a slight difference in category 11; Teacher Observing. This difference may be due to the greater degree of continuous involvement by trained teachers, but the difference is so small, no conclusion is possible based on these data.

Hypothesis 9 was partially confirmed. There was a statistically significant difference between trained and untrained teachers on the positive components of differentiated instruction. There was no difference on the negative components. Trained teachers did have, however, a lower percentage of behaviors in each negative component category.

Hypothesis 10 was not confirmed. There was no statistically significant difference among program types on positive, negative and neutral components of differentiated instruction. The only trend noted is that Heterogeneous programs had a higher percent of negative components and a lower percent of positive components. This would be expected because of the fact that gifted students are a minority in these classrooms.

Trained teachers of the gifted do engage in behaviors that are different from those of regular classroom teachers. Questioning strategies, reinforcement patterns and size and variety of instructional groups are the areas in which most notable differences occur.

Resource rooms demonstrated the highest level of differentiation while heterogeneously organized classrooms demonstrated the lowest level. A question of how such differentiation has been integrated into regular academic topics remains unanswered in this study.

The highest frequency of desirable "differentiated teaching behaviors for the gifted" occurs in small group interactions. Surprisingly, interactions with individuals tend not to include significant percentages of higher cognitive level questioning. This finding was explained by further analysis of the interaction in which diagnostic inquiries by the teachers were found to predominate. That is, teachers' interactions with individuals focused on the students' use of time, materials and resources rather than on thought process. Specifically, planned higher cognitive level interactions occurred most often in small group settings.

Summary

Trained and untrained teachers of the gifted were observed and compared in the areas of individualization, cognitive quality of interaction, response patterns, and overall differentiation. A systematic classroom observation instrument developed for the study was effective in differentiating between the two groups. As expected, trained teachers used a greater variety of instructional patterns, asked more higher cognitive level questions and responded more facilitatively. Students in these classes gave more higher level responses and initiated interaction more often. Unexpected results

included an indication that the most higher cognitive level activity occurs in small group settings.

Results from this study indicate that a teacher's qualifications for the classroom interaction component of instructing the gifted lie in:

1 - Use of a variety of grouping patterns.

2 - Spontaneous use of higher cognitive level questions.

3 - Facilitative responding rather than correcting or praising comments.

Verbal interactions utilized by teachers of the gifted and maintenance of a variety of grouping patterns designed to meet unique needs of gifted students have been operationalized in this study. Results may be used in pre-service training programs as well as program evaluation in which the occurrence of differentiated instruction requires validation.

Table 1a

Observations

Group Size by Teacher Training

Group	Total Observation Time (in minutes)	Large Group N = 13+	Small Group N = 2 - 12	Individuals
Trained Teachers	2,157	28%	33%	39%
Untrained Teachers	323	56%	15%	29%

Chi Sq = 17.56 df = 2 $p < .001$

Table 1b

Observations

Group Size by Program Type

Group	Total Observation Time (in minutes)	Large Group	Small Group &	Individuals
Depart-mentalized	593	30%	46% (68%)	22%
Self-Contained	553	51%	04% (48%)	44%
Resource Room	510	20%	37% (79%)	42%
Heterogeneous	501	26%	35% (73%)	38%

Chi Sq = 58.43 df = 6 $P < .001$

Table 2
Category of Interaction x Teacher Training
in Percent of Time

Teachers	Category 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Experimental	12.9	12.1	6.5	14.0	11.9	5.0	1.1	5.6	6.8	2.6	0.8	11.6	4.8	2.3	1.2	0.7
Control	20.9	0.9	6.9	9.7	15.5	0.4	0.8	9.1	8.9	1.5	1.7	7.8	6.6	4.4	3.8	0.7

Chi Sq = 23.41 df = 15 N.S.

Table 3
Category of Interaction x Program Type
in Percent of Time

Program Type	Category 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Dept.	13.7	13.0	6.2	14.4	10.7	5.1	0.7	5.5	5.2	2.0	1.6	13.2	4.4	2.6	1.4	0.9
S.C.	11.7	8.8	8.0	18.3	8.8	3.7	2.4	6.1	8.7	3.4	1.0	9.8	4.3	2.3	0.8	0.8
R.R.	14.1	11.0	6.6	15.8	11.5	4.6	0.6	3.3	6.7	3.1	1.1	8.2	4.2	1.8	1.2	0.7
Het.	20.3	4.1	5.5	9.0	16.3	3.7	0.7	7.2	7.5	1.4	0.4	10.6	6.5	3.6	2.5	0.6

Chi Sq = 26.59 df = 45 N.S.

Table 4
Category of Interaction x Grouping Pattern
in Percent of Time

Pattern	Category 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Large	15.9	8.8	5.3	11.9	13.5	3.0	1.4	7.5	7.8	1.4	0.7	12.8	4.6	2.9	1.8	0.6
Small	14.1	15.9	4.3	12.9	10.9	7.5	0.8	4.7	5.0	1.8	0.5	11.8	5.4	2.5	1.5	0.4
Individual	14.7	4.2	9.6	16.7	12.7	2.6	1.1	5.0	8.2	3.9	1.6	7.2	5.3	2.6	1.5	1.0

Chi Sq = 23.95 df = 30 N.S.

Table 5

Questioning Components at Differentiated Instruction by Exp. Control

	Category 1	2	5	6	row total
Exp.	12.9	12.1	11.9	5.0	41.9
Cont.	20.9	0.9	15.5	0.4	37.7
Col. Total	33.8	13.0	27.4	5.4	79.6

Chi Sq = 15.95 df = 3 $P < .01$

Table 6

Teacher Response Components of Differentiated Instruction by Exp. Control

	Category 10	12	13	14	15	row total
Exp.	2.6	11.6	4.8	2.3	1.2	22.5
Cont.	1.5	7.8	6.6	4.4	3.8	24.1
Col. Total	4.1	19.4	11.4	6.7	5.0	46.6

Chi Sq = 3.29 df = 4 N.S.

Table 7

Neutral Components of Instruction by Exp. Control

	Category 3	7	11	16	row total
Exp.	6.5	1.1	0.8	0.7	9.1
Cont.	6.9	0.8	1.7	0.7	10.1
Col. Total	13.4	1.9	2.5	1.4	19.2

Chi Sq = .09 df = 3 N.S.

Table 8

Positive Components of Differentiated

Instruction by Exp - Control

	2	4	6	10	12	Row Total
Exp.	12.1	14.0	5.0	2.6	11.6	45.3
Cont.	0.9	9.7	0.4	1.5	7.8	20.3
Col. Total	13.0	23.7	5.4	4.1	19.4	65.6

Chi Sq = 11.9 df = 4 P< .05

Table 9

Negative Components of Differentiated

Instruction by Exp - Control

	1	5	8	9	13	14	15	Row Total
Exp.	12.9	11.9	5.6	6.8	4.8	2.3	1.2	45.5
Cont.	20.9	15.5	9.1	8.9	6.6	4.4	3.8	69.2
Col. Total	33.8	27.4	14.7	15.7	11.4	6.7	5.0	114.7

Chi Sq = .42 df = 6 N.S.

Table 10

Negative Components of Differentiated

Instruction by Program Type
in percent of time

Program Type	Category 1	5	8	9	13	14	15	Row Total
Dept.	13.7	10.7	5.5	5.2	4.4	2.6	1.4	43.5
S.C.	11.3	8.8	6.1	8.7	4.3	2.3	0.8	42.3
R.R.	14.1	11.5	3.3	6.7	4.2	1.8	1.2	42.8
Het.	20.3	16.3	7.2	7.5	6.5	3.6	2.5	63.7
Col. Tot.	59.4	47.3	22.1	28.1	19.4	10.3	5.9	192.3

Chi Sq = 3.20 df = 18 N.S.

Table 11

Negative Components of Differentiated

Instruction by Group Size
in percent of time

Group Size	Category 1	5	8	9	13	14	15	Row Total
Large	15.9	13.5	7.5	7.8	4.6	2.9	1.8	54.0
Small	14.1	10.9	4.7	5.0	5.4	2.5	1.5	44.1
Ind.	14.7	12.7	5.0	8.2	5.3	2.6	1.5	50.0
Col. Tot.	44.7	37.1	17.2	21.0	15.3	8.0	4.8	148.1

Chi Sq = 1.59 df = 12 N.S.

Table 12

Neutral Components of Differentiated

Instruction by Type of Program
in percent of time

	Category				
Program	3	7	11	16	Row Total
Dept.	6.2	0.7	1.6	0.9	9.40
S.C.	8.0	2.4	1.0	0.8	11.48
R.R.	6.6	0.6	1.1	0.7	9.0
Het.	5.5	0.7	0.4	0.6	7.2
Col.Total	26.3	4.4	4.1	3	37.8

Chi Sq = .14 df = 9 N.S.

Table 13

Neutral Components of Differentiated

Instruction by Group Size
in percent of time

	Category				
Group Size	3	7	11	16	Row Total
Large	5.3	1.4	0.7	0.6	8.0
Small	4.3	0.8	0.5	0.4	6.0
Ind.	9.6	1.1	1.6	1.0	13.3
Col.Total	19.2	3.3	2.8	2.0	27.3

Chi Sq = .09 df = 6 N.S.

Table 14

Positive Components of Differentiated

Instruction by Type of Program
in percent of time

	Category					
Program	2	4	6	10	12	Row Total
Dept.	13.0	14.4	5.1	2.0	13.2	47.7
S.C.	8.8	18.3	3.7	3.4	9.8	44.0
R.R.	11.0	15.8	4.6	3.1	8.2	42.7
Het.	4.1	9.0	3.7	1.4	10.6	28.8
Col. Total	36.9	57.5	17.1	9.9	41.8	163.2

Chi Sq = 4.58 df = 12 N.S.

Table 15

Positive Components of Differentiated

Instruction by Group Size
in percent of time

	Category					
Group Size	2	4	6	10	12	Row Total
Large	8.8	11.9	3.0	1.4	12.8	37.9
Small	15.9	12.9	7.5	1.8	11.8	49.9
Ind.	4.2	16.7	2.6	3.9	7.2	34.6
Col. Total	28.9	41.5	13.1	7.1	31.8	122.4

Chi Sq = 9.89 df = 8 N.S.

Appendix

Differentiated Instruction: A Classroom Verbal Interaction Scale

This instrument is designed as a live classroom observation instrument. A frequency tally is recorded for every discrete piece of verbal behavior emitted by a teacher and student(s) with whom the teacher is interacting.

Student Talk

Category	Label	Behavior
1	Lower Level Response	The student offers a response based on recall and/or comprehension of information.
2	Higher Level Response	The student provides evidence of processing information in order to create a response.
3	Question	The student asks a question.
4	Information	The student volunteers to share information not in direct response to a teacher directive.

Teacher Talk (Indirect)

5	Lower Level Question	The teacher asks a question defined as knowledge or comprehension. (Bloom Taxonomy)
6	Higher Level Question	The teacher asks a question defined as Application, Analysis, Synthesis or Evaluation according to Bloom's Taxonomy.
7	Small Talk	The teacher engages in personal conversation with the student.

Teacher Talk (Direct)

8	Command/Request	The teacher makes a statement for which either an overt or covert student response is anticipated.
9	Lecture/Instruction	The teacher is presenting information for which no immediate student response is required.
10	Suggestion	The teacher offers a student one of several alternative opportunities.

Teacher Talk (Responding)

11	Observing	The teacher is listening to or watching students engaged in interacting with each other or with materials.
12	Acknowledging	The teacher merely indicates that a student response or request has been offered.
13	Confirming	The teacher indicates that a student response meets some criteria established for the group.
14	Correcting	The teacher provides feedback designed to modify or correct a student response.
15	Praising	The teacher provides positive praise for the students contribution.

Teacher Talk (General)

16	General	Management oriented and/or non-definable teacher behavior.

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